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Stakeholder decision-making: Understanding Sierra Leone's energy sector

S.A. Hirmer [a,*], H. George-Williams [b], J. Rhys [a], D. McNicholl [c,1], M. McCulloch [a]

[a] Energy and Power Group, Department of Engineering Science, University of Oxford, England, UK
[b] De Montfort University, England, UK
[c] Vancouver, Canada

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ABSTRACT

The Sierra Leone energy sector suffers from multiple problems of inadequate capacity and finance. Most of the population does not have access to electricity, and supply is often unreliable. At the same time the country has been trying to implement significant structural and economic reforms, aimed both at government policy objectives and more market-driven operation. The focus of this paper is to achieve a better understanding of current decision-making processes and issues in terms of their impact on inception, planning, implementation and operation of projects. This should assist consideration of organisation and governance for the sector. The method has been to apply the Responsible, Accountable, Consulted, and Informed (RACI) matrix with surveys of key actors in the sector including ministries, utilities and regulatory bodies, development partners and independent power producers. These were predominantly middle or senior managers most closely associated with the electrification. An initial online survey with 11 key informants allowed us to identify important linkages in decision-making processes. A further 16 face-to-face interviews with 30 interviewees added depth and helped identify weaknesses and challenges. Key findings relate to the conflicting frameworks of market driven pressures and government or policy driven objectives, and the lack of a clear pathway for change. Resulting problems include misaligned goals, unclear or inconsistent communication channels and ambiguous responsibilities. At the same time the sector is hindered by a lack of capacity, insufficient finance and threats from 'briefcase organisations'. The paper also discusses some key remedies for these issues which include streamlined decision-making processes, clearly defined stakeholder roles and improved communication channels.

1. Introduction

Understanding decision-making of key stakeholders is a crucial part of changing the landscape of the energy sector. This research paper seeks to shed light on decision-making in Sierra Leone, including who is important, their motivations and decision-making dynamics for electricity supply.

The current state of Sierra Leone's energy sector is in acute need of improvement: 80% of Sierra Leoneans do not have access to electricity [1]. Of those that have access, 17% are connected to the grid and another 2–3% are connected to solar, mini-grid or portable home energy systems [*ibid*]. The main source of electricity from the grid in Sierra Leone is from the Bumbuna Hydropower scheme, which operates at approximately 50 MW during the rainy season [2] and 8 MW in the dry season.[2]

As a result of the cost of electricity provision from ageing power plants in Freetown (and in Sierra Leone more generally) – with their very high Operation and Maintenance (O & M) costs – the country is largely dependent on temporary electricity supply [3]. This includes electricity from a floating power plant called *Karpowership*,[3] at a monthly cost of approximately US$2 million, that is moored at Freetown's harbour [5] and is contracted to supply up to 50 MW of electricity [6]. This, together with other factors, including commercial and technical losses amounting to 45% of generation, makes Sierra Leone's energy sector financially unsustainable.[4]

Current global trends are driving humanity to adopt a more sustainable ethos. Climate change demands a rethink in the relationship

* Corresponding author.
E-mail address: stephanie.hirmer@eng.ox.ac.uk (S.A. Hirmer).
[1] Independent Researcher.
[2] From personal conversations with Bumbuna site engineers.
[3] Karpowership – operated by Karadeniz Energy Group – provides floating power plants powered by heavy fuel oil [4].
[4] Losses of US$18 M, US$32 M and US$45 M were reported in 2017, 2018 and 2019 respectively [7].

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Abbreviations

ADEA	Association for the Development of Education in Africa
AfDB	African Development Bank
APC	All People's Congress
BADEA	Arab Bank for Economic Development in Africa
CIDCA	China International Development Cooperation Agency
CLSG	Côte d'Ivoire, Liberia, Sierra Leone and Guinea
DDO	Diversability Development Organization
DfID	Department for International Development
DPs	Development Partners
ECREEE	ECOWAS Regional Centre for Renewable Energy and Energy Efficiency
EDSA	Electricity Distribution and Supply Authority
EEG	Energy for Economic Growth
EGTC	Electricity Generation and Transmission Company
EPASL	Environmental Protection Agency
EU	European Union
EWRC	Electricity and Water Regulatory Commission
IDREC	Interdivisional Research Ethics Committee
IPP	Independent Power Producers
JICA	Japan International Cooperation Agency
MCCU	Millennium Challenge Coordinating Unit
MDAs	Ministries, Departments and Agencies
MoE	Ministry of Energy
MoF	Ministry of Finance
MoH	Ministry of Health
MoJ	Ministry of Justice
MoL	Ministry of Lands
MoPED	Ministry of Planning and Economic Development
MoW	Ministry of Water
MPs	Members of Parliament
MWR	Ministry of Water Resources
NGOs	Non-Governmental Organisations
NPA	National Power Authority
NPPA	National Public Procurement Authority
NWRMA	National Water Resources Management Agency
O&M	Operation and Maintenance
PPA	Power Purchase Agreement
PPPU	Public Private Partnership Unit
RACI	Responsible, Accountable, Consulted, and Informed
REASL	Renewable Energy Association of Sierra Leone
RNA	Rapid Network Assessment
SDGs	Sustainable Development Goals
SLPP	Sierra Leone People's Party
TBI	Tony Blair Institute
UNOPS	United Nations Office for Project Services
WB	World Bank

between fossil energy and development. Countries like Sierra Leone are also under political and economic pressure to restructure their energy sectors and reform their utilities, which have often failed to develop flexible electricity systems that can provide firms with a reliable supply and people with access to electricity. It is now well established from a variety of studies that Sub-Saharan countries, like Sierra Leone, have the potential to expand their generation and achieve universal access to electricity by leapfrogging into new technologies [8,9], building electricity systems needed to sustain growth [10] and creating jobs to lift millions of people out of poverty [11]. Reflecting these external pressures and despite the aforementioned constraints, Sierra Leone has set ambitious targets in its energy sector reform roadmap for 2017 to 2030 [12]. These targets aim at improving access to electricity, achieving financial sustainability and restoring public confidence in the sector [*ibid*]. On access, the goal is to increase the proportion of households with access to electricity from 12.9% at the start of 2018 to 27% by 2023 [13]. This process would include raising the number of electrified chiefdoms[5] in the country from 14 reached in 2018 to at least 115 [14]. Financial targets include restructuring of the electricity tariff, reducing technical and commercial losses to 20% and reducing the overall fiscal deficit of the Electricity Distribution and Supply Authority (EDSA) to 26% by 2023 [7]. Other targets include reducing the unavailability of grid electricity from 10 to zero hours a day and ensuring that renewable energy accounts for 40% of installed capacity by 2023 [15].

For the energy sector in Sierra Leone to improve and meet these targets at the rate required, some transformative changes are needed. Robust and resilient solutions, acceptable to a range of different stakeholders, are needed across the energy sector. Electricity provision is inseparable from broader societal issues such as the environment [16], risk management [17] and health policy [18]. It is also an imperative for reducing poverty levels and for ensuring sustainable development. It is vital for achieving many of the Sustainable Development Goals (SDGs) [19]. It follows that decisions related to electricity provision have profound impacts on individual lives, the economy, national security and the environment. While better decision-making is not the only solution to address many of the challenges faced in Sierra Leone's energy sector, it is an important one that is investigated as part of this study.

Despite the importance of decision-making in the energy sector, understanding of this subject in Sierra Leone is limited. To add to this knowledge gap of decision-making in Sierra Leone, this research paper conducts a stakeholder network analysis to better understand decision-making dynamics within the sector. This is the first time such a study is conducted in the context of Sierra Leone's energy sector. The paper is organised as follows. Section 2 reviews the literature of decision-making and from this the particular methods and tools are chosen and then discussed in Section 3. Section 4 sets out background information on the structure of the energy sector and the role of different organisations in Sierra Leone. This is followed by a discussion of the main results of the study, including an understanding of the decision-making process in terms of its key actors, motivators and key strengths and weaknesses. Section 5 concludes the paper, presenting the main findings and some perspectives for further research.

To ensure the study's integrity, a risk and ethics assessment following the Medical Sciences Interdivisional Research Ethics Committee (IDREC) at the University of Oxford in accordance with the procedures laid down by the University for Ethical Approval for all research involving human participants was completed and approved with Reference: R68195/RE001. With permission from participants, interviews were recorded. To protect the participants' identity, all names were anonymised.

2. Decision-making in the energy sector

2.1. Understanding decision-making

Decisions by most government sectors are made by sector-specific agencies or ministries [20]. The International Atomic Energy Agency [21] defines decision-makers as those actors responsible for identifying the problems needing a solution and for choosing from the possible solutions derived by decision support studies, according to the decision-makers' own values and priorities and within the prevailing political and social context. However, interdependencies between sectors

[5] A chiefdom is composed of communities outside the Western Area (Freetown).

and the increasing complexity of considering environmental and social impacts demands that decision-makers seek holistic solutions that take account of and are acceptable to a wider range of stakeholder interests, not just those that are sector specific [22].

The literature on decision-making in the energy sector highlights pathways centred on short-term and long-term decisions [23]. Short-term decisions are often based on the current state of a nation and urgent and immediate needs or challenges. Long-term decisions are predominantly driven by forecasts and predictions, as well as broader objectives. Long-term energy forecasts make several assumptions about human behaviour and technological advancements. Hence Craig et al. [24] warn that due to the complexities and uncertainties that characterise human behaviour, decision-makers should be cautious; failure to account for imperfections in forecasting can lead to misjudgements and consequently incorrect decision pathways. The need to take the right decision pathway is accentuated by the long-life nature of electricity infrastructure. The European Commission [20, p.15] puts it clearly,

> Choices and decisions matter about which energy […] facilities to develop and where, which power plants to build, which to retire and which energy or cooling technologies to deploy and develop. Energy infrastructure is designed to last for decades ….

This is all the more important as global climate change imperatives point to a compelling case for avoiding "high carbon lock-in" through building carbon-intensive electricity systems [25–27]. Taking this into account, decision-makers in developing countries must meet a double energy challenge of increasing both the scale and the pace of electrification in order to kick-start social and economic development [11,28].

Studies on power industry transitions in Europe [29] identify two decision pathways: market-led and government-led. In the market-led decision pathway, decisions were taken by actors at undertakings running either private or public profit-motivated businesses. Market logic should be driven by the demand-side with more focus on innovations in consumption [30]. In contrast, the government-led pathways tend to focus on following planning-based decisions which address concerns of policy, security of supply, cutting production costs and controlling the industrial sector. Thus, to a greater extent, the government-led pathways may be more dominated by supply-side issues. Similar to many other developing countries, Sierra Leone has agreed – in principle – to follow market-oriented reforms, but the reality is that most decisions stem from the supply side and are government driven. This is almost inevitable in Sierra Leone's electricity system, as it has major supply side problems and where the people will look to the government for solutions.

Energy sector stakeholders operate at different levels within a power structure and have conflicts of interests [31–33]. Consequently, different decision-makers will have distinct attitudes towards the problem and the 'best' solution will differ from one decision-maker to another, depending on their particular acceptance of, or aversion to, risks and uncertainties [34]. Moreover, trust is increasingly becoming central to the decision-making process in the energy sector that is characterised by complexity, a wide range of uncertainties, multiple stakeholders, large economic and environmental trade-offs and constraints from regulations and other controls [35]. Much of the trust discourse centres around providing affordable, reliable, sustainable and modern energy for all in an equitable way by 2030 and in line with Sustainable Development Goal 7 [36].

Achieving sustainability should be at the heart of decision-making in the energy sector. However, there is a history of optimism bias and hubris in the delivery of electrification projects, coupled with the persistence of bad policies with expensive, dirty, inefficient and insecure outcomes [37,38]. This has justified closer examination of decision-making tools, models and approaches [39,40]. In an effort to achieve at least acceptable outcomes, if not optimal, several tools for mapping stakeholder decision-making have been developed. Some of these are discussed in the following section.

2.2. Stakeholder analysis tools

The purpose of stakeholder analysis tools is to provide useful information to: A) identify who is involved in the decision-making process; B) understand the roles of the different stakeholders; and C) help provide information on decision-making processes, power dynamics and stakeholder interests [41,42].

Stakeholder network analysis is an approach for quantitative analysis of relationships between actors. It is frequently applied to development and natural resource management literature [43]. It involves understanding stakeholders with different expertise and priorities [44]. Stakeholder analysis can be applied to understand power dynamics and enhance the transparency and equity of decision-making in development projects. The approach can develop an inventory of those who would have a role in decision-making, gauge their importance through their level of influence and their interest for a particular outcome, map the relationships between the actors and understand their potential for developing alliances [42]. In the context of the energy sector, it has been used for a variety of applications such as biomass energy development in Slovenia [45] and renewable energy project policy and planning in Australia [46] and Indonesia [47]. It has ranged from understanding ethical and moral issues in the primary resource sector [48] to decision-making for research and development on poverty-focused rural mechanisation [49].

Reed et al. [43] classify stakeholder analysis as: A) a bottom-up "reconstructive method"; or B) a top-down "analytical categorisation". The reconstructive method refers to the process in which stakeholder classifications emerge during the stakeholder mapping and are defined by the stakeholders themselves [50]. In contrast, analytical categorisation refers to the use of predetermined parameters [*ibid*], such as interest and influence, cooperation and competition, cooperation and threat and urgency, legitimacy and influence. This is often done through matrices or Venn diagrams [51].

The RACI matrix is one popular method for characterising stakeholder roles and uses interest and influence to classify stakeholders through a "responsibility assignment matrix" [52]. The RACI model distributes authority, making power dynamics explicit by defining roles in a task, project or management activity [*ibid*]. It was selected for this study, as it was seen as more appropriate for broadly categorising relative levels of importance in decision-making processes. It is also intuitive, can be explained easily and is readily understood by people with no prior familiarity with the RACI model. RACI refers to:

- **Responsible**: Those who do the work to complete the task
- **Accountable**: The one ultimately answerable for the correct and thorough completion of the task
- **Consulted**: Those whose opinions are sought
- **Informed**: Those who are kept up-to-date on progress.

Having established which stakeholder analysis tool is appropriate for this study, the next section explains the overall research design in more detail.

3. Research design

This study seeks to better understand decision-making and its dynamics in Sierra Leone's energy sector, including who is important, their motivations and decision-making dynamics regarding electricity supply, and the key decision-makers at different project phases. To do this an egocentric network mapping approach was adopted [53]. For this network mapping methods and the RACI matrix are combined to generate data on stakeholder roles through primary interviews. More specifically, the following exercises were undertaken:

A) a rapid network assessment (RNA);
B) an online survey; and
C) face-to-face interviews.

The purpose of this stepped approach was to enable relevant stakeholders to inform the wider interview roster, beginning with a known group of decision-makers representing both market-led and government-led approaches. Identified stakeholders – which are listed in full below and consisted predominantly of middle or senior managers were then asked to name others that are relevant to decision-making in the energy sector as part of the RNA, which in turn informed the participants for the online survey. Through this approach, any actor deemed to be a relevant decision-maker, be it a government authority or corporate enterprise, could be identified and included. Actors which are not included were not widely identified as relevant to the study scope by others. This process is further described below.

3.1. Rapid network assessment

The purpose of the RNA was to generate an initial list of individuals important for decision-making processes in the Sierra Leone energy sector. To guide this process, individuals relevant to on-grid and off-grid electricity supply decisions and policy making were identified from an initial list of stakeholders in the Ministry of Energy (MoE), Electricity and Water Regulatory Commission (EWRC), Electricity Generation and Transmission Company (EGTC), Electricity Distribution and Supply Authority (EDSA), Department for International Development (DfID),[6] the United Nations Office for Project Services (UNOPS) and selected Independent Power Producers (IPPs). These stakeholders provided the initial list of participants for the online survey, based on the stakeholders they interact with on electrification projects. This process is known as snowball sampling.[7] A total of 29 stakeholders were identified.

3.2. Online survey

Following the RNA, an online survey was conducted. The purpose of this survey was to 1) verify and, where needed, expand on the stakeholder list originally generated as part of the RNA; and 2) to understand how these stakeholders engaged with each other in decision-making processes. As part of the survey, participants were therefore required to: (A) list additional stakeholders that are typically involved in electrification projects and decision-making in Sierra Leone's energy sector; (B) indicate their frequency of interaction with all stakeholders listed; (C) identify key influences for on-grid and off-grid decisions and policy making; and (D) identify the typical role of key stakeholders in decision-making using the RACI matrix. Of the 29 participants identified by the RNA, a total of 11 participants – spanning different types of organisations (see Table 1) – took the online survey.

3.3. Face-to-face interviews

Following the online survey, face-to-face interviews were undertaken during the first quarter of 2020. A total of 16 interviews were conducted (see Table 1). The number of participants in each interview varied from 1 to 6 participants. A total of 30 people took part in the 16 interviews.[8] Stakeholders were predominantly middle to senior management and involvement was dependent on availability; all stakeholders identified were invited to partake.

Table 1
Study participants of online survey and face-to-face interviews per organisation type.

Organisation	Online Survey Participants	Face-to-Face Interviews (multiple participants)
IPP	2	3
Government office	3	7
Utilities	2	2
Donor	2	3
Financial institution	1	–
NGO	–	1
Total	11	16

The interviews took approximately 30 min and consisted of two parts: 1) a stakeholder mapping exercise using the RACI matrix to fill data gaps that remained after the online survey and 2) a verbal semi-structured interview. For the first network mapping exercise, participants were asked to list stakeholders that are typically involved in energy sector projects and decision-making in general. These names were placed on an RACI matrix: each name was written on a post-it note and placed on the appropriate location of the 2x2 matrix. Participants subsequently indicated stakeholder involvement at different stages of project development: from inception to planning, implementation and operation. Defining involvement by project phase, rather than by project type, was recommended by the first interviewee and was a methodological improvement over the online survey that was originally deployed. This was because, in the case of Sierra Leone, almost every key stakeholder is involved in a typical project, regardless of its type.[9] A generalised picture, therefore, would not provide much insight. Investigating who does what and when, however, should reveal the crux of how the sector works. The network data generated during the interview formed the basis for the qualitative discussion which were broadly centred around the following four guiding questions:

1) How are decisions in the energy sector made?
2) Who were the key decision-makers and what roles do they play?
3) What are the main influences on their decisions?
4) How could decision-making be improved?

The information from the verbal interviews are used to support the assertions made in Section 5. Stakeholder quotations are interspersed as part of a collective database without attribution to a specific interviewee.

3.4. Data analysis

The online surveys were analysed using Gephi network software [55]. Analysis produced preliminary graphic representations of the data in order to identify clustering and gaps in the stakeholder network. The

[6] Please note that since the writing of this article DfID has merged with the Foreign and Commonwealth Office (FCO). This unit is now known as the Foreign, Commonwealth Development Office (FCDO).

[7] Snowball sampling is a process whereby participants are asked to identify others relevant to the topic studied [54]. It is a commonly used approach for identifying an initially unknown roster of relevant stakeholders.

[8] The interviewees in each interview were from the same organisation, and were interviewed as a unit. In most cases, one person spoke on behalf of the group, with occasional contribution from the other members. Interviewees were instructed to respond from the perspective of the organisation they represented. The implication is that data represent institutional roles and relationships more so than those of individuals.

[9] This was also in line with the findings from the online survey that confirmed a close knit of stakeholder involved in all projects.

online survey response rate was insufficient to conduct quantitative analysis, and these preliminary graphics were therefore used primarily to inform areas for subsequent investigation during face-to-face interviews. Specifically, preliminary analysis suggested the presence of a tight cluster of interactions. Rather than continuing with whole network analysis, face-to-face interviews placed increased emphasis on the roles played by stakeholders at different stages of project development rather than a generalised view of sector involvement. There was a focus on project stages because A) the whole network analysis was not providing much insight on sector dynamics and B) the first interviewee recommended this change.

To understand the relative importance of different stakeholders, the physical placement of the different stakeholders in the form of post-it notes on the RACI matrix (as part of the face-to-face interviews) was converted into X and Y coordinates, whereby overall coordinates for each stakeholder were calculated by averaging the given coordinates for each stakeholder from all the interviewees. Each set of coordinates in the RACI matrix was transformed to a single digit score, S, that denotes how influential that stakeholder is in Sierra Leone's energy sector. In the transformation:

- the most accountable stakeholder, sitting at the upper right corner of the RACI matrix with coordinates (1,1), was awarded a score of 4. In general, the score, S, for a stakeholder anywhere in the first quadrant was deduced from:

$$S = 4 - 0.5\sqrt{(1-X)^2 + 9(1-Y)^2} \quad (1)$$

  where X and Y are the coordinates of the stakeholder in the RACI matrix;
- the most responsible stakeholder, sitting at the upper left corner of the RACI matrix with coordinates (−1,1), was awarded a score of 3. In general, the score, S, for a stakeholder anywhere in the second quadrant was deduced from:

$$S = 4 - 0.5\sqrt{(1-X)^2 + 4(1-Y)^2} \quad (2)$$

- the most consulted stakeholder, sitting at the lower left corner of the RACI matrix, with coordinates (−1,-1), was awarded a score of 2. In general, the score, S, for a stakeholder anywhere in the third quadrant was deduced from:

$$S = 1 + 0.5\sqrt{(1-X)^2 + 4(1-|Y|)^2} \quad (3)$$

- the most informed stakeholder, sitting at the lower right corner of the RACI matrix, with coordinates (1,-1) was awarded a score of 1. In general, the score, S, for a stakeholder anywhere in the fourth quadrant was deduced from:

$$S = 1 + 0.5\sqrt{(1-X)^2 + 9(1-|Y|)^2} \quad (4)$$

- the score for a stakeholder at the intersection of two quadrants was taken as the average of the scores yielded by the equations for the two quadrants;
- and stakeholders at the origin were awarded a score of 2.5, which is the average of the scores yielded by Equations (1)–(4).

The score for each stakeholder was normalised by the fraction of interviews that identified the stakeholder as relevant to decision-making. The absolute score, S_{abs}, for each stakeholder was obtained from its relative score, S, using the expression:

$$S_{abs} = S\frac{N}{16} \quad (5)$$

where N is the number of interviews mentioning the stakeholder. This score was then expressed as a percentage of the relative score for the most influential stakeholder in Sierra Leone's energy sector.

The qualitative interview discussions were transcribed and underwent a process of inductive coding, using *HyperResearch* [56], whereby themes emerge from the coding process. To ensure consistency, cross-sectional indexing was used [57]. This resulted in the following outputs:

(A) Ranking of stakeholders by their perceived importance in decision-making in the energy sector as a whole;
(B) Ranking of stakeholders by their frequency of involvement in the different project phases; and
(C) An understanding of decision-making processes and power dynamics described during qualitative interviews.

3.5. Research limitations

The stakeholders interviewed as part of this study may not represent all stakeholders relevant to decision-making in the energy sector in Sierra Leone. This paper used an initial list of key stakeholders to inform the wider roaster of actors deemed relevant stakeholders for inclusion (snowball sampling). The limitation is dependence on respondents to provide recommendations. For example out of the 29 stakeholders identified from the RNA, only 11 took the online survey. Therefore the findings here were non-conclusive and only indicative of sector dynamics. This may have also led to results being skewed towards those who completed the survey and some stakeholder groups (e.g., the Petroleum Directorate or the oil sector more generally) being excluded–although they may have been represented indirectly through Independent Power Producers (IPPs). Notably as a result of the initial list of stakeholders, end-users were underrepresented. Responses nevertheless indicated a degree of consensus around the most relevant actors. Subsequent work may revisit the established roster of interviewed decision-makers, particularly if a revised scope places increasing focus at sub-national and local levels of the sector. It should also be stated that there was a difference in numbers of interviewees representing institutions. This was partially due to the availability of actors during the time of interviews and may have further skewed the results.

4. Results and discussion

This section presents the results of the stakeholder analysis and the discussion of those results with the aim of generating a better understanding of decision-making in Sierra Leone's energy sector. The section is broadly laid out to follow the four guiding questions stated in Section 3.

1) How are decisions in the energy sector made?
2) Who were the key decision-makers and what roles do they play?
3) What are the main influences on their decisions?
4) How could decision-making be improved?

More specifically, a brief background regarding the structure of the energy sector and the role of different organisations in Sierra Leone is provided (Section 4.1). This is followed by an investigation on how stakeholders in Sierra Leone's energy sector are positioned (Section 4.2), their role in decision-making in the sector in general (Section 4.3), as well as with regards to the different project phases (Section 4.4). The core motives of decision-making in the energy sector in Sierra Leone applicable to different stakeholder groups are then discussed (Section 4.5). Finally, the discussion highlights decision-making strengths and

weaknesses and identifies opportunities for improvement (Section 4.6).

4.1. Sierra Leone's energy sector organisation

Sierra Leone's energy sector is made up of a network of stakeholders. Each has specific and clearly defined responsibilities, albeit these should be in alignment with the overarching goal of providing reliable, affordable and sustainable power to the people of Sierra Leone [12,58]. Key stakeholders include the Ministry of Energy (MoE), the two electricity utility companies (namely, the Electricity Generation and Transmission Company (EGTC) and Electricity Distribution and Supply Authority (EDSA)), the regulator (namely, the Electricity and Water Regulatory Commission (EWRC)), Independent Power Producers (IPP), Ministries, Departments and Agencies (MDAs), parliament, development partners (DPs), Independent Power Producers (IPPs). These are further discussed below.

The MoE, led by the Minister of Energy (the political head) and the Permanent Secretary (the professional head), sits at the centre of this network of stakeholders. The primary mandate of the MoE is to provide oversight functions across the sector, as well as implement the central government's agenda and policies on energy [58]. These agendas and policies, most often, are in alignment with the manifesto of the ruling political party and therefore are susceptible to change after national elections that usher in a new government. Sierra Leone's political landscape is dominated by two political parties: the ruling Sierra Leone People's Party (SLPP) and the opposition All People's Congress (APC). Since gaining independence in 1961, the APC has ruled for a total of 35 years, the SLPP for 18 years and the military for 6 years [59]. However, following the birth of multiparty democracy in 1996, the two parties have ruled for almost equal periods, with power changing hands every two terms (a term is five years). It is therefore unsurprising that Sierra Leone's energy policies since independence have generally oscillated between the development plans of these political parties.

The EDSA is responsible for distribution and revenue collection from consumers, as well as operation of the transmission grid below 33 kV. The EGTC manages generation and transmission above 33 kV. These two were previously a single entity, the National Power Authority (NPA), before being unbundled in a sector reform process through an Act of Parliament in 2011 [60]. Some ambiguities in their relationship remain even though the reform process has concluded. One such ambiguity is that the EDSA and EGTC were intended to be independent entities with a strict producer–consumer relationship. However, to date, their operations are largely subsidised by the central government, which in return, appoints their top management staff as well as the board of directors. In addition, the EDSA owes the EGTC huge sums in arrears for energy generated [7]. According to a number of interviewees, the latter, apparently, has no means of redress.

The unbundling of the NPA also gave birth to the EWRC. It regulates the operation of utility companies and IPPs, balancing their interests with those of the consumer to ensure fairness [61]. In the energy sector, it achieves this by developing, monitoring and reviewing tariff guidelines, regulatory frameworks, quality standards and licensing requirements for operators.

MDAs' – like the Ministry of Finance (MoF), Ministry of Justice (MoJ), Ministry of Planning and Economic Development (MoPED), Ministry of Lands (MoL), and the Public Private Partnership Unit (PPPU) – also play crucial roles in the energy sector. The MoF for instance, ensures fiscal discipline in the planning of projects funded by the central government and administers government subsidies to utilities. The MoJ ensures that there are no legal loopholes in energy contracts between the MoE and its contractors. The MoPED ensures that the policies and strategies of the MoE are in line with the central government's development agenda. The MoL facilitates the acquisition of land for energy projects and ensures that new power plants are not built on protected land. The PPPU sits in the Office of the Vice President of Sierra Leone and was established to provide professional advice on public–private partnership agreements between public and private institutions [62]. The MCCU is a US aid agency, also in the Office of the Vice President of Sierra Leone. Its goal is to help improve the financial viability of Sierra Leone's energy sector as part of a $44M programme [63].

The parliament of Sierra Leone, the legislative arm of government, presides over the enactment of national energy policies that require government approval. Since members of parliament represent the nation as a whole, parliament serves as a gateway for informing government about the energy needs of the people. This is one of the functions of the parliamentary committee on energy. The committee also provides oversight functions for ongoing and commissioned electrification projects.

Development Partners (DPs) and financing institutions contribute to the development of the energy sector through direct funding of specific projects and capacity building. The United Nations Office for Project Services (UNOPS), for instance, has recently commissioned solar minigrids in 54 communities across 12 districts in Sierra Leone [64].

IPPs – which include independent developers, investment banks and other investment firms – are central to meeting Sierra Leone's electrification targets. Fundamentally, they are interested in selling electricity to either consumers or the grid through a Power Purchase Agreement (PPA).

4.2. Decision-making dynamic

The RACI matrix was used to identify how stakeholders were positioned in Sierra Leone's energy sector, as illustrated in Fig. 1.

The stakeholder interviews showed that while the key actors (i.e., the Ministry of Energy-Technical (MoE-T), -Political (MoE-P), Electricity Generation and Transmission Company (EGTC), Electricity Distribution and Supply Authority (EDSA) and Independent Power Producers (IPPs)) were consistently identified – this is in line with the preliminary results from the online surveys which indicated a closely linked sector with a limited number of actors – there was less consistency in terms of their perceived roles. Specific roles can also differ by project. Fig. 2 shows a summary of the perceived roles of key stakeholders (those with an importance score, S_{abs}, of more than 10%).

Most key actors were consistently placed in particular roles (i.e., MoE-P, IPPs, Ministry of Finance (MoF) and the Electricity and Water Regulatory Commission (EWRC)). It is interesting to observe that there was greater deviation in placing the technical arm of the MoE (i.e., MoE-T). This may be attributed to differing responsibilities related to specific projects. For the utilities, EDSA and EGTC, an almost equal percentage of interviews places them as accountable ($\sim$ 45%) and informed ($\sim$ 55%). This is not surprising as both can play dual roles as authorities and implementers. Apart from the Millennium Challenge Coordinating Unit (MCCU), there was also less consensus on the role of development partners (DPs) (e.g., UNOPS, DfID, JICA) and financial institutions (e.g., World Bank and AfDB). This may be attributed to differing levels of involvement in projects depending on who initiates and oversees specific programmes. Organisations often play a larger influencing role in projects that they are funding.

4.3. Decision-making – general

From the network mapping, a number of core actors important in the energy sector in general are identified. This is based on the absolute score (S_{abs}) and is shown in the overall bar plot in Fig. 3. These core actors were also among the most important throughout all project phases. They are now discussed below with the absolute importance score shown in brackets.

- **Ministry of Energy (MoE-Political Wing=100, MoE-Technical Wing=48)**: The MoE, more specifically the political and senior authorities, is at the centre of decision-making. Regardless of the project type, the MoE-P is directly involved at all stages of a project

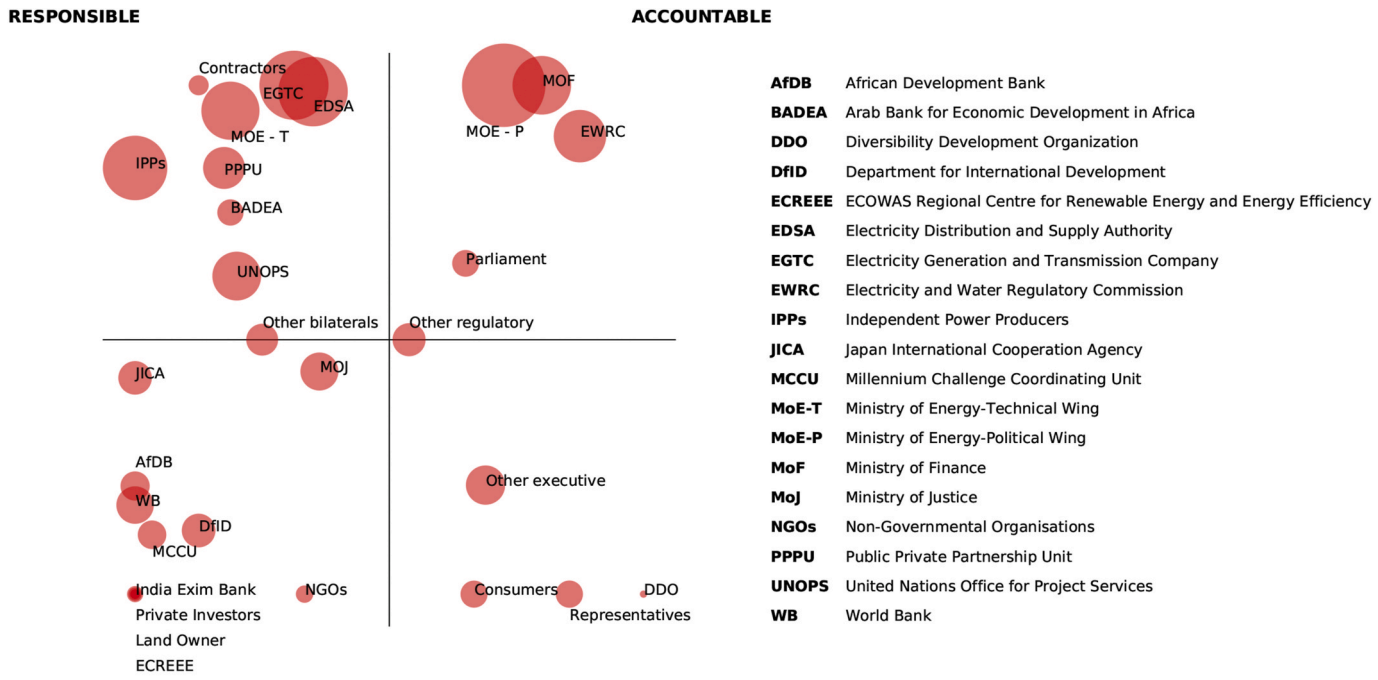


Fig. 1. RACI matrix for decision-making in Sierra Leone's energy sector. The position of each stakeholder is defined by the average X and Y coordinates of that stakeholder, as obtained from the interviews. The size of the circle is directly proportional to the stakeholder's absolute influence score, which is based on a transformation of the coordinates of its position. The transformation assigns a score of 4 to the most accountable stakeholder, 3 to the most responsible, 2 to the most consulted and 1 to the most informed. This score is then normalised by multiplying it by the fraction of interviews that identified it as relevant to decision-making and expressed as a percentage of the score for the most powerful stakeholder.

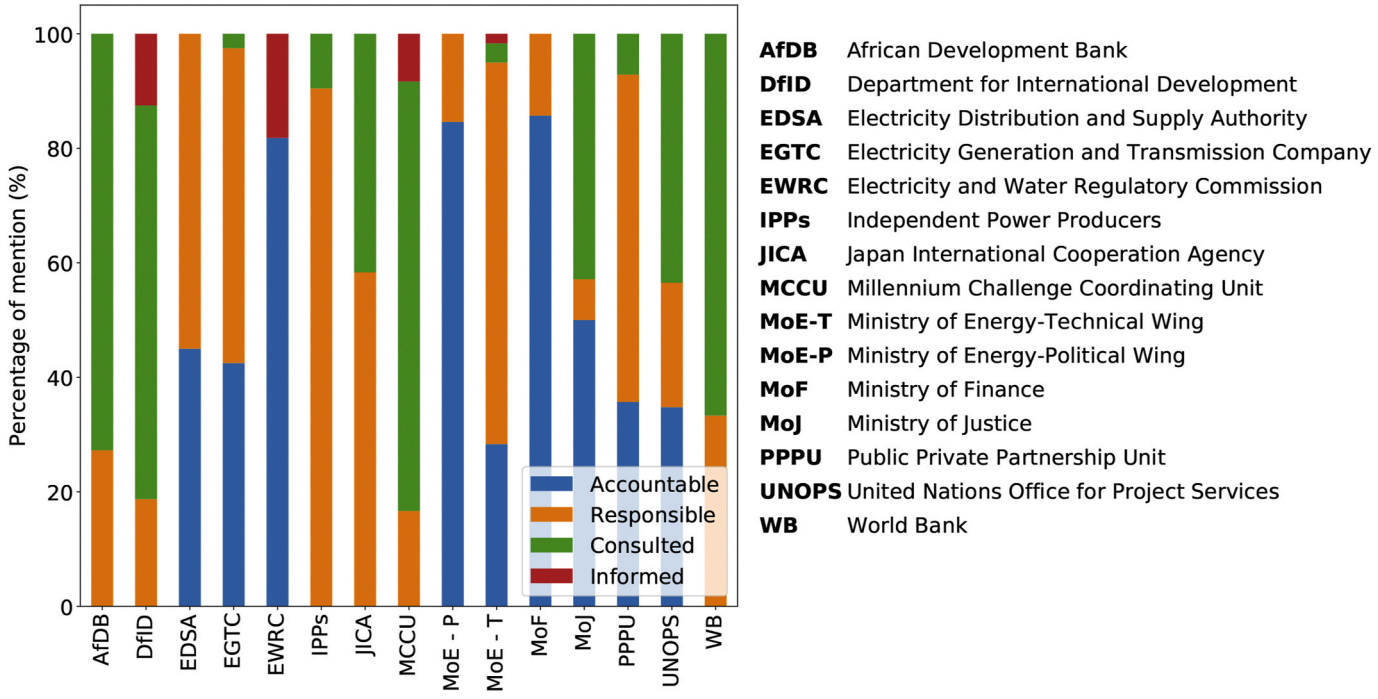
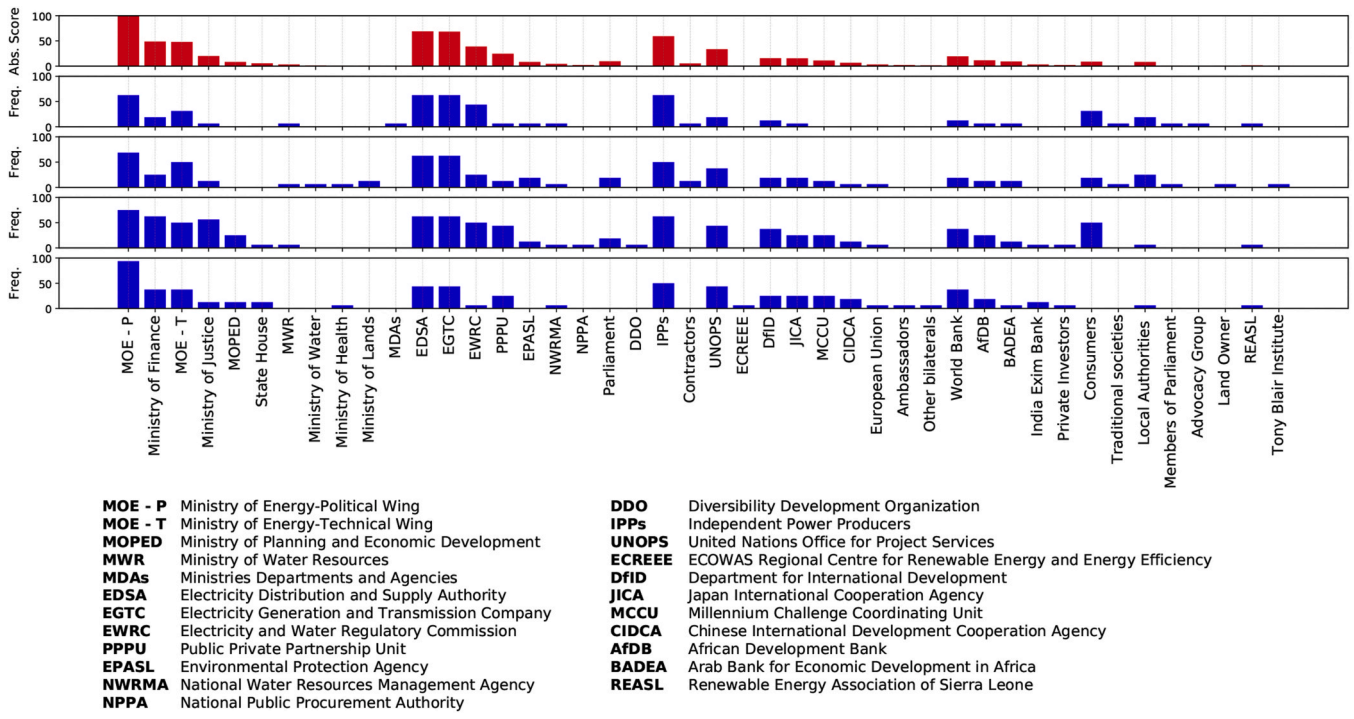


Fig. 2. Key stakeholders and their RACI roles as a function of the percentage of interviews in which they were mentioned as playing those roles in a typical energy project.

and always ranked as most important. Signoff from this authority is thus key throughout the project and buy-in from MoE officials is central to the success of any project. Interestingly, however, the technical arm of this ministry (i.e., MoE-T), though also involved at every stage of the project life cycle, is not as powerful as the political arm at the inception phase. This is so because the initial stages of projects are predominantly discussed at the political level, which is usually the case for government and donor initiated projects.



MOE - P	Ministry of Energy-Political Wing	**DDO**	Diversibility Development Organization
MOE - T	Ministry of Energy-Technical Wing	**IPPs**	Independent Power Producers
MOPED	Ministry of Planning and Economic Development	**UNOPS**	United Nations Office for Project Services
MWR	Ministry of Water Resources	**ECREEE**	ECOWAS Regional Centre for Renewable Energy and Energy Efficiency
MDAs	Ministries Departments and Agencies	**DfID**	Department for International Development
EDSA	Electricity Distribution and Supply Authority	**JICA**	Japan International Cooperation Agency
EGTC	Electricity Generation and Transmission Company	**MCCU**	Millennium Challenge Coordinating Unit
EWRC	Electricity and Water Regulatory Commission	**CIDCA**	Chinese International Development Cooperation Agency
PPPU	Public Private Partnership Unit	**AfDB**	African Development Bank
EPASL	Environmental Protection Agency	**BADEA**	Arab Bank for Economic Development in Africa
NWRMA	National Water Resources Management Agency	**REASL**	Renewable Energy Association of Sierra Leone
NPPA	National Public Procurement Authority		

Figure 3. Bar plots of stakeholders showing the number of times they were mentioned for each stage of a typical energy project (Inception, Planning, Implementation (Impl.), and Operation) and their absolute influence score (top chart: Overall). The absolute influence score is based on a transformation of the coordinates of the stakeholder's position in the RACI matrix. The transformation assigns a score of 4 to the most accountable stakeholder, 3 to the most responsible, 2 to the most consulted and 1 to the most informed. This score is then normalised by multiplying it by the fraction of interviewees that identified it as relevant to decision-making and expressed as a percentage of the score for the most powerful stakeholder.

- **Utilities (EDSA=69, EGTC=68)**: The two government-owned utilities, EDSA for distribution and EGTC for generation and transmission, were identified as playing a key role in the country's electricity generation and delivery. These two utilities contain most of the professional engineering expertise in Sierra Leone that is relevant to generation, transmission and distribution. They are also aware of the operating characteristics of the electricity system as it is today and hence of the technical and economic implications of changes to it. The essential requirement of coordination in any electricity system inevitably makes them key actors, which explains why they are more active at the planning, implementation and operation phases of projects rather than the inception phase.
- **Independent Power Producers (IPPs=59)**: IPPs, such as Winch Energy, Energicity and Powergen RE, are central to meeting Sierra Leone's electricity needs. They are becoming increasingly important because they are seen as providing a source of finance for the major investments that are required. It is not surprising that they have been identified as key actors in the decision-making processes, but this identification requires careful interpretation. In principle, multiple IPP will be competing to offer projects to Sierra Leone, and their advice will primarily be of relevance in relation to the particular projects that each of them is willing to offer. Their motivation will also necessarily be geared to their own financial interest and should be seen in the context of actual or potential competition with other IPP providers or in the context of negotiation with the government of Sierra Leone on particular projects. They are most active at the implementation and operation phases of government and donor initiated projects but at all four phases of IPP-initiated projects.

4.4. Decision-making – project phases

Discussed below are the four project phases of a project in Sierra Leone (inception, planning, implementation and operation) and the top stakeholders in each phase in terms of their frequency of selection see Fig. 3).

4.4.1. Inception phase

Project inception usually begins at the political level. Decisions typically include political dimensions, in line with the manifesto of the government in power at the time. Thus having signoff from the MoE, more specifically the MoEs' Political and Senior Authorities, is key at the inception stage. Projects can be initiated by Government, Development Partners (DPs) or an IPP. The decision-making process partially depends on the origin of the project. For example, an IPP can make an unsolicited proposal to the government for a project or respond to a government call for proposals. The IPPs role in decision-making and the stages where they are involved will be affected by this process. The stakeholders in the inception phase which are involved in decision-making depends on who initiates the project. For instance, a project financed by a DP will naturally draw greater involvement from that DP in decision-making. In Sierra Leone, substantial resources come from DPs (e.g., DfID, JICA) or financing institutions (e.g., World Bank): they currently finance much of the energy sector in Sierra Leone. Even projects with private sector involvement may still have significant contribution from DPs. Thus it is unsurprising that they are ranked highly for decision-making in the inception phase. In fact, they maintain presence at all stages of the projects they initiate or fund. A number of other key stakeholders, as well as the above, are particularly important to decision-making at the inception phase:

- **Parliament**: Major sector decisions may require formal parliamentary approval to confirm their legal status. Much of the decision-making is, however, delegated to ministries for management and even support in drafting legislation. Parliament also, sometimes, influences the initiation of projects, based on the needs of the communities its members represent.
- **Other Ministries**: Other Ministries and regulators are also involved at early stages. Government entities including the Ministry of Justice

(MoJ), the Ministry of Finance (MoF) and the Public Private Partnership Unit (PPPU) are involved to assess project risks and other factors.
- **Local authorities**: These regional offices can affect the decision-making process. Some, such as Paramount Chiefs, have direct personal connections to senior government officials that they can influence, particularly in terms of decisions relating to project location.

4.4.2. Planning

There is little bandwidth for project planning in Sierra Leone and the logical planning process that would be expected for an energy sector "does not exist".[10] This can partially be attributed to the country's lack of internal resources for direct project funding and its dependence on DPs. Reliance on external resources undermines the planning process. The MoJ and the MoF, in particular, have specific mandates to assess fiscal and legal risk in energy sector projects at the planning stage of a project. Other agencies including the PPPU and EWRC also play important formalised oversight roles. Therefore it is not surprising that these organisations have been frequently mentioned during this stage. Said key stakeholders are further discussed below:

- **Electricity and Water Regulatory Commission (EWRC)**: At this stage of a project, the role of the EWRC is granting licences to IPPs, discussing tariff structures and undertaking periodic tariff reviews with these IPPs. It also ensures that IPPs have the required documentation to operate in Sierra Leone. The capacity of EWRC has reportedly been developed with support from UNOPS as part of their Rural Renewable Energy Project. The EWRC was commended for its effectiveness, by non-government stakeholders, during this research.
- **Ministries, Departments and Agencies (MDAs)**: The MoF has a particularly important role to play at the planning stage of projects funded by the government of Sierra Leone and also in Power Purchase Agreements (PPAs) between the government and IPPs. Its approval is required before such projects can move to the next stage. The MoJ is the Sierra Leone government's legal representative during project contract negotiations. A project cannot move to the next stage without its no-objection advice. At this stage of the project, the PPPU guides the MoE in private-public partnership agreements with stakeholders in the private sector (IPPs for instance).

4.4.3. Implementation

The most active stakeholders at this stage of the project life cycle are the IPPs and private sector contractors who are charged with the responsibility of bringing the project to completion. To achieve this, they work with the Environmental Protection Agency (EPASL), consumers (local communities) and the Ministry of Lands (MoL). These stakeholders, together, help in the acquisition of land for the project and enforce adherence to Sierra Leone's environmental policies. Other stakeholders involved at this stage are the EWRC, the Sierra Leone parliament, donor partners (for donor initiated projects) and the utilities, EGTC and EDSA. EDSA, for instance, works with IPPs to ensure that off-grid plants that would eventually connect to the grid meet certain technical requirements.

4.4.4. Operation

The utilities (EGTC for generation and transmission and EDSA for distribution) are seen as most important at the operations stage. This is not surprising, as they are responsible for technical work and operations of Sierra Leone's electricity system. Although important, the importance of the MoE is less – in contrast to other stages – at the operation stage because once a project is commissioned, the MoE's role is reduced to providing oversight. They are only called into action if something grave is amiss or a PPA requires an extension. Nevertheless, a number of interviewees had mentioned that the active participation of the technical arm of the MoE at this stage could help MoE engineers to become familiar with decisions and technical matters that are relevant for the success of projects. It is believed this approach would improve capacity for making future decisions, particularly in the operations phase after implementation.

Another important stakeholder here is EWRC, as they preside over tariff reviews, ensure strict adherence to regulatory standards and, most importantly, monitor service delivery to ascertain compliance to pre-agreed quality standards and value for the consumers' money.

Finally, IPPs were mentioned as being very prominent at this stage of the typical project and rightly so, since normal practice is that they operate the power plants they build.

4.5. Stakeholder motives

A number of core objectives of decision-making in the energy sector in Sierra Leone applicable to different stakeholder groups were identified. These are further discussed below.

- **Everyone wants the energy sector to improve.** There is broad intent to improve the energy sector in Sierra Leone. This is because energy is a serious issue, everyone is crying, 'we want energy'. People are asking for light even more than water. The motivation to get things done and advance the sector is visible across the range of stakeholders, from consumers to politicians and from donors to technocrats. Consumers feel the impact of service quality directly and can be frustrated by delays in implementation.
- **Politicians want quick and visible results.** The political arm of the government – including the MoE and the MPs – want quick and visible results. The government manifesto typically drives the priorities of political stakeholders and most of the decisions have been political instead of technical. This creates pressure on the government both to make services affordable by reducing tariffs and to attract resources that can deliver new projects. New projects also provide more visible results, and therefore more political capital, than maintenance activities.
- **Other governmental entities are trying to minimise risk and liability.** The MOJ and the MOF, in particular, have specific mandates to assess fiscal and legal risk in energy sector projects. Other agencies, including the PPPU and the EWRC, also play important formalised oversight roles. These risks appear to be real. Multiple stakeholders commented on 'sharks' or 'briefcase organisations' attempting to establish unfavourable deals with the government.
- **Technocrats implement and strive for systematic planning.** Technocrats are considered to do the engineering. Engagement of the technical arm typically follows the initially political decision-making process. Technocrats, such as representatives from the EDSA or EGTC, are motivated to optimise planning and ensure that technical specifications are met.
- **The private sector is motivated by profits.** The motives of private service providers such as IPPs are perhaps unsurprising: profitability comes first. As one interviewee states: Beyond politics, it's the business model that drives everything. Fundamentally, IPPs are interested in selling electricity to either consumers or the grid through a PPA.
- **Donor objectives and worldviews influence priorities.** Donors carry influence because of sector dependence on their resources. They can have their own agenda that extends beyond the scope of the Sierra Leone energy sector such as wanting to promote certain approaches or technology types. Western donors, for example, may be motivated to promote renewables because they are part of an international 'green' agenda.
- **Desire for sustainable services.** There is a perception that the government understands that things are not really working on any

[10] As outlined in Section 3, stakeholder quotations are interspersed as part of a collective database without attribution to a specific interviewee.

level in the energy sector and that this needs to change. The amount of subsidy needed for energy is undermining other sectors. There is an appetite for alternative options and a willingness to accept that desirable political outcomes such as tariff reductions need to be balanced with the need to sustain commercially viable services.

- **Politicians are motivated to support their constituents.** Politicians can face considerable pressure from their local constituents for support on local initiatives. Equally, MPs can feel a strong motivation to give back to their home regions. According to one interviewee, if projects (such as the CLSG project[11]) had been more accessible to local influences, then the interviewee would have ensured that the transmission line passed through their home village rather than its current route.

At a more detailed level, the motives for prioritising certain projects or approaches over others was not clear and can thus not be commented on. Below some key decision-making implications and opportunities for improvements are discussed.

4.6. Decision-making strengths and weaknesses

Some government stakeholders perceive there to be an open and transparent decision-making process in Sierra Leone that is functioning well. While this was not explicitly endorsed by stakeholders outside of government, 30% of interviewees mentioned that existing decision-making processes in Sierra Leone are working well but that there is room for improvement. This leads on to what is and what is not working fully with regards to decision-making in Sierra Leone from the perspective of the stakeholders interviewed as part of the face-to-face interviews. Where applicable, key recommendations are given in **bold**.

Presently, each stakeholder group involved has its own policy, mandate and perspective, resulting in decision-making processes which are not always clear. Government, Development Partners (DPs) and individuals can affect sector outcomes. To elaborate, every government has its own manifesto, and a change in government means a change in priorities. A further challenge is that projects can last longer than one term of office, which can lead to delayed, compromised or suspended implementation. As one interviewee states: At times, a change of government affects everything in our country. This can be corroborated by Tengbe et al. [65, p.10], who found, in their review of law in Sierra Leone, that: The present position of the law does not reflect or administer these aspirations [optimising the renewable energy potentials of the country] […]. Aspirations are reflective of the intentions of the present government and therefore form 'policy'. In a similar sentiment, DPs can significantly affect processes. Planning is difficult due to dependence on donor funding for projects, which is hard to influence. The government reacts to project opportunities because it needs the investment; this reliance on external resources can undermine the planning process. Plans can be developed but, without the resources to implement them, these plans can easily be sidelined if other opportunities arise. Such challenges also apply at the level of individuals – not just broad political objectives – since decision-making is about people as much as their positions. Thus it is not surprising that ultimately decisions can sometimes directly reach the level of the president. This dependence on government, DPs and individuals can create bottlenecks in the process. To address this, the sector could greatly benefit from **streamlined decision-making processes**.

One option here would be the development of a **comprehensive plan that is independent** from government, DP or individual priorities and is adhered to by key stakeholder groups. While an energy sector roadmap[12] for Sierra Leone has been rolled out in 2018 [12], those interviewed clearly see this as insufficient. In congruence with this, stakeholders called for clear processes and steps to be established and followed, saying that "the sector is not really there right now". If a clear process is in place, then project proposals that do not meet requirements need not even approach the MoE. While the Millennium Challenge Coordinating Unit (MCCU) is supporting the development of an Independent Power Producer (IPP) solicitation process,[13] it is clear from the interview commentary that more work is needed in this area.

However, for the aforementioned streamlining process to be successfully implemented, there is a **need to address the existing capacity gap** in the sector. Reportedly there are insufficient resources to maintain consistent processes, particularly within the MoE. The importance of building the capacity of key decision-makers has also been highlighted by Sokona [66, p.2] who writes that capacity is not the ability to implement someone else's agenda but the ability to set and pursue your own agenda and, in that sense, it should be a core element of any development narrative. The capacity gap in Sierra Leone has direct implications on the ability to manage contracts and administration more broadly: contracts can get lost in the pile, procurement is slow and there is little bandwidth for planning. This may also be attributable to the fact that responsibilities are somewhat fluid: they change depending on specific projects. The result is that the processes are unclear: it is not certain who needs to be involved at which stage of a project. For example excluding, Local Authorities from certain stages of decision-making can cause problems later on. This points towards a need for **clearly defined roles for key stakeholders**. That said, the foregoing capacity gap is not only apparent in the MoE but also in other governmental offices such as Parliament. Thus parliament and MPs are unable to participate in sector decision-making to the extent needed, preventing them from playing a more active oversight role.

In addition to addressing this capacity gap, another aspect identified from the interviews as important to streamlining decision-making processes is that of **improved communication channels**. At present, unclear or inconsistent communication channels negatively affect decision-making processes. As a result many key stakeholders are uninformed about ongoing activities in the sector. This in turn directly corroborates reports of existing coordination challenges. The implication is that multiple parts of the sector need to improve simultaneously for the sector to advance overall. For example, generation is unhelpful if energy cannot reach consumers. Utilities – in this case EDSA (responsible for distribution) – cannot pay power producers (EGTC (responsible for generation and transmission) or IPPs) if they operate with substantial losses. This clearly illustrates the **need for better sector coordination**.

Not only that, several stakeholders recommended that **technocrats should be more involved in decision-making** at the project inception phase: the authorities are out of sync with technical realities and the political agenda at times is the main focus. This could help guide decisions that lead to technically sound projects: decisions should be informed by robust planning and a technical understanding of the issues. This is particularly important as the current underperformance of the state-owned utilities – EDSA and EGTC – significantly impacts decision-making in the sector. This affects what is prioritised and who is involved.

[11] The Côte d'Ivoire, Liberia, Sierra Leone and Guinea (CLSG) electricity networks interconnection project involves the construction of a transmission line to connect the national networks of the aforementioned four countries.

[12] The roadmap [1] is a document that identifies, at a high level, what the government wants and how they want it. It lays out a vision for the energy sector in Sierra Leone. The intent is for IPPs proposing projects to fit into the vision defined by the roadmap.

[13] The IPP solicitation process is developed by the MoE in collaboration with the MCCU for both solicited and unsolicited IPP procurement. If successful, this process will help to define the steps and requirements of IPPs seeking to develop energy projects in Sierra Leone.

There needs to be a clear strategy either to recognise the utilities as public entities or to bring in independent governance to drive performance incentives. Under the current state-owned model, there is a bias towards politically motivated decision-making, and project implementation can be hindered when key stakeholders are not fully incorporated into the decision-making process.

A final key decision-making aspect that was mentioned is the facilitation of IPPs. They can face common challenges when establishing their operations and working through sector decision-making processes. The presence of stakeholders to broker relationships between the MoE and IPPs could help to improve this interaction. Currently, with the absence of such brokers to help manage relationships and aggregate issues, each IPP has to individually establish and maintain relationships with the MoE. Through a brokered relationships, IPPs could be able to negotiate service arrangements. To this end, there is a need for selected **stakeholders to act as liaisons or brokers** that help IPPs engage MoE.

5. Conclusion

This research set out to better understand decision-making in Sierra Leone. This included examining who are the key decision-makers; what are their roles at which stage of the project (inception, planning, implementation and operation); how are decisions made; and what are the main influences on their decisions.

First this study considered who made decisions and at which stage of the project. It was found that the different actors with the greatest relevance in different aspects of the sector are fairly clear. They include, irrespective of the project stage, the Ministry of Energy (MoE), the utilities (Electricity Distribution and Supply Authority (EDSA) for distribution and Electricity Generation and Transmission Company (EGTC) for generation and transmission) and Independent Power Producers (IPPs). Other actors that are particularly important to decision-making at the different stages are as follows: 1) the United Nations Office for Project Services (UNOPS) at the project **inception phase**. This is unsurprising as the decision-making at the inception phase depends partly on the origin of the project. In the case of UNOPS, they have recently launched a large-scale energy access programme in Sierra Leone. 2) The Electricity and Water Regulatory Commission (EWRC) and the Public Private Partnership Unit (PPPU) at the **planning stage** of a project. At this stage, the PPPU is responsible for guiding the MoE on agreements with stakeholders. The EWRC grants licences and oversees that the appropriate documentation is in place. 3) The **implementation stage** tends to match the initiation stage: whoever launched the project will have a greater relevance. 4) At the **operation stage** – albeit important throughout – the utilities (EGTC and EDSA) play a particular important role as they are responsible for the technical work and operations in Sierra Leone's electricity system.

Secondly influences in decision-making were examined. While formal processes exist for most state-owned institutions and departments, decision-making in Sierra Leone depends significantly on individuals and their interests. Our study was unable to provide insights at a more detailed level on decision-making motives for prioritising certain projects or approaches. Nonetheless, it was evident that decision-making in Sierra Leone is influenced by the desire for 1) energy access at all levels of decision-making; 2) quick and visible results from politicians; and 3) reduction of risk and liability for governmental entities such as the Ministry of Justice or Ministry of Finance.

This presents a challenge to achieving the transformative shift needed within the desired timescales. At the moment, priorities do not align with one another – something that is not uncommon to decision-making in general [67]: different actors have different objectives. This in turn affects sector outcomes and is counterproductive to progress in the energy-sector.

Finally, this paper identified improvements that need to be made to decision-making processes in Sierra Leone's energy sector. A number of key observations can be made on the basis of the analysis and descriptive detail outlined in this publication. The most important observations that emerged from the stakeholder interviews are a need for clearly defined stakeholder roles, improved communication channels and streamlined decision-making processes. A new comprehensive plan which clearly addresses these issues, together with capacity building, would be an important step in improving the decision-making in Sierra Leone.

Author credit

SA Hirmer: Conceptualization, Methodology, Formal analysis, Writing.: H George-Williams: Methodology, Investigation, Formal analysis, Software.: J Rhys: Writing.: D McNicholl: Investigation, Data curation.: M McCulloch: Funding acquisition, Conceptualization, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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